

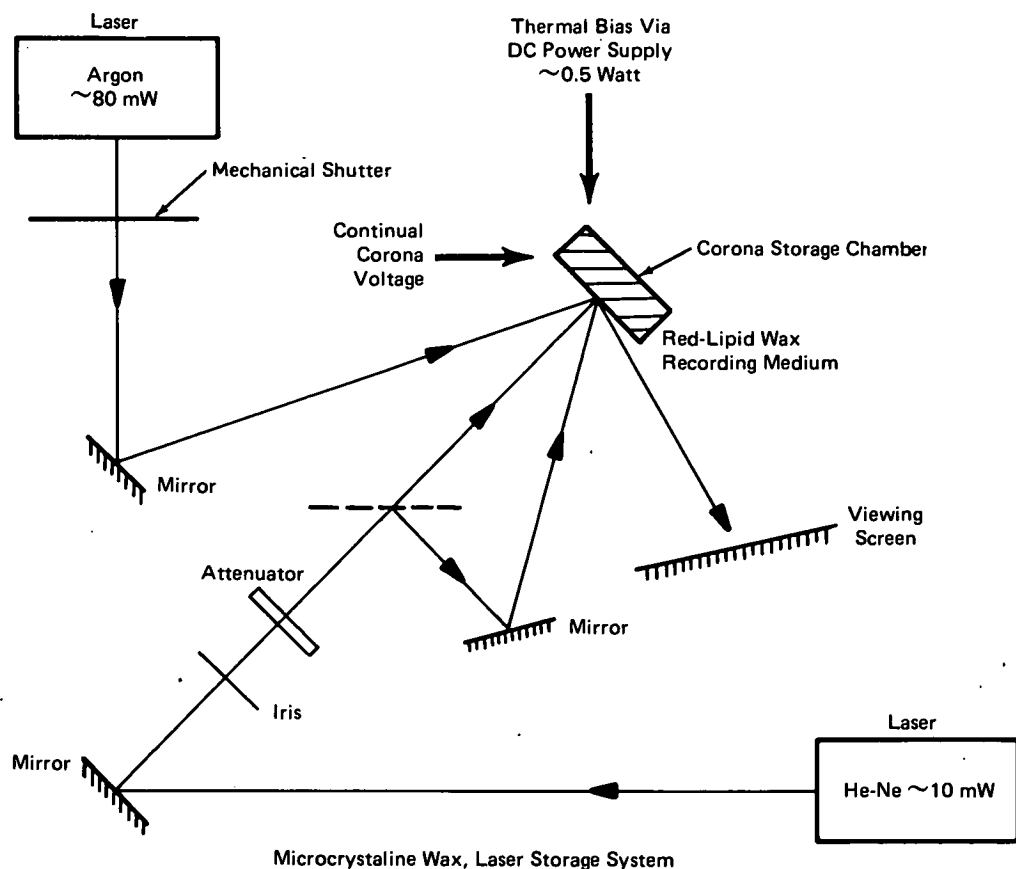
# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### Laser Addressed Holographic Memory System



A new holographic recall and storage system uses a red-lipid microcrystalline wax as the storage medium. The wax serves as an appropriate write/erase medium because it has, for waxes, a sharp, thermal crystal/plastic transition range (around  $2^{\circ}\text{C}$ ).

The experimental arrangement is shown in the figure. The storage device consists of a TIC-coated glass substrate, a PVK photoconductor, an elevacite barrier, and the microcrystalline wax. A corona discharge ionizes the air around the wax causing it to become charged

with positive ions. The holograph beam redistributes the charge. When the wax is softened, this charge causes thickness variations in the wax surface, representing the intensity pattern of the beam.

The wax is thermally biased (heated to a temperature just below the transition temperature) by direct current passed through the transparent TIC substrate. When the laser beam strikes the wax, its energy heats the point of incidence enough to pass the wax through the transition temperature. A holograph image can then be written or erased in the softened wax.

(continued overleaf)

An argon laser at 80 mW provides thermal energy, and a helium-neon laser provides the second beam for the interference pattern. The resultant image may be read off a viewing screen.

Page selection is accomplished by moving the storage device. In a more advanced system, a single laser and an electronic light-modulator could be used to select pages.

**Notes:**

1. NASA Tech Brief B73-10166 contains information related to this system.
2. Requests for further information may be directed to:  
Technology Utilization Officer  
Marshall Space Flight Center  
Code A&PS-TU  
Marshall Space Flight Center, Alabama 35812  
Reference: B73-10155

**Patent status:**

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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under contract to  
Marshall Space Flight Center  
(MFS-22565)